CLAIMS

I claim:

1. A seismic sensitive inertial mass motion system for protecting an earthborn structure from seismic activity comprising:

a seismic power converter consisting of

a chamber suitable for permanent surface or subterranean placement proximate a base component of said structure; and

a mass loosely contained within said chamber, said chamber configured with an available range of motion for inertial displacement of said mass in at least one axis;

a servo displacement unit associated with said structure and oriented for operation in the same said at least one axis; and

a means for translating said displacement of said mass to said servo displacement unit.

2. A seismic sensitive inertial mass motion system according to claim 1, comprising two sets of said power converter and respective said servo displacement unit, a first said set being oriented at right angles to a second said set.

3. A seismic sensitive inertial mass motion system according to claim 2 comprising three sets of said power converter and respective said servo displacement unit, a third set being oriented at right angles to each of said first set and said second set.

4. A seismic sensitive inertial mass motion system according to claim 1, said chamber comprising a hydraulic cylinder filled with hydraulic fluid, said mass comprising a piston having a home position at a midpoint within said cylinder, said means of translating comprising hydraulic lines, said servo displacement unit comprising a hydraulic slave cylinder.

5. A seismic sensitive inertial mass motion system according to claim 1, said means of translating comprising cables, said servo displacement unit comprising a cable connection.

6. A seismic sensitive inertial mass motion system according to claim 1, said system associated with at least one base isolated support component of a base isolated structure, said servo displacement unit linking the ground to said base isolated support component, said means for translating said displacement comprising an inertially in phase linkage of said mass to said support component whereby the inertial in-axis position of said mass and said support component are the same.

7. A seismic sensitive inertial mass motion system according to claim 6, said chamber comprising a hydraulic cylinder filled with hydraulic fluid, said mass comprising a piston having a home position at a midpoint within said cylinder, said means of translating comprising hydraulic lines, said servo displacement unit comprising a hydraulic slave cylinder.

8. A seismic sensitive inertial mass motion system according to claim 1, said system associated with a non-isolated structure, said servo displacement unit linking a movable counter mass to said structure, said means for translating said displacement of said mass comprising a linkage of said mass to said counter mass whereby an in-axis movement of said chamber results in an opposing movement of said counter mass.

9. A seismic sensitive inertial mass motion system according to claim 8, said chamber comprising a hydraulic cylinder filled with hydraulic fluid, said mass comprising a piston having a home position at a midpoint within said cylinder, said means of translating comprising hydraulic lines, said servo displacement unit comprising a hydraulic slave cylinder.

10. A seismic sensitive inertial mass motion system according to claim 9, said non-isolated structure comprising a building.

11. A seismic sensitive inertial mass motion system according to claim 9, said non-isolated structure comprising a bridge supported on bridge supports.

12. A seismic sensitive inertial mass motion system for protecting an earthborn structure from seismic activity comprising:

at least one seismic power converter securely earthbound with a selected axis and angle proximate one base isolated support component of a base isolated structure, and consisting of

a hydraulic master cylinder filled with hydraulic fluid and configured with an available range of motion for inertial displacement of a piston equal to at least the range of motion of a typical earthquake and a home position at midpoint in said range of motion; and

a said piston loosely contained within said master cylinder and normally resting at said home position;

at least one hydraulic servo cylinder associated with said structure and oriented in the same said axis and angle as its respective said master cylinder; and

hydraulic lines for translating said displacement of said piston to said hydraulic servo cylinder, said servo displacement unit linking the ground to said base isolated support component, said means for translating said displacement comprising an inertially in phase linkage of said piston to said support component whereby the inertial in-axis position of said piston and said support component remain equal.

13. A seismic sensitive inertial mass motion system for protecting an earthborn structure from seismic activity comprising:

at least one seismic power converter securely earthbound with a selected axis and angle proximate a base support component of a non-isolated structure, and consisting of

a hydraulic master cylinder filled with hydraulic fluid and configured with an available range of motion for inertial displacement of a piston equal to at least the range of motion of a typical earthquake and a home position at midpoint in said range of motion; and

a said piston loosely contained within said master cylinder and normally resting at said home position;

at least one hydraulic servo cylinder linking a counter mass to said structure and oriented in the same said axis and angle as its respective said master cylinder; and

hydraulic lines for translating said displacement of said piston to said hydraulic servo cylinder, said hydraulic servo cylinder linking a movable counter mass to said structure, said hydraulic lines translating said displacement of said piston comprising a linkage of said piston to said counter mass whereby an in-axis movement of said master cylinder results in an opposing movement of said counter mass.

14. A seismic sensitive inertial mass motion system according to claim 13, said non-isolated structure comprising a building.

15. A seismic sensitive inertial mass motion system according to claim 13, said non-isolated structure comprising a bridge supported on bridge supports.

16. A seismic sensitive inertial mass motion system according to claim 15, said at least one power converter comprising at least two power converters proximate each said base support component and oriented at right angles to each other.

17. A seismic sensitive inertial mass motion system according to claim 14, said hydraulic servo cylinder linking a movable counter mass to said structure comprising a two ended servo cylinder and movable counter mass assembly of fixed length, the two ends of which are secured to two respective attach points in said structure, said counter mass being movable along a line there between.

18. A system for the preservation of structures from seismic activity, the system comprising:

a master hydraulic cylinder buried in the earth;

a piston disposed and biased for resting at a home position within said cylinder;

first and second hydraulic lines each having first and second ends, said first ends being connected to respective first and second ends of said master cylinder; and

a hydraulic servo cylinder assembly connecting a base isolated support component of a base-isolated structure to the earth and to which are connected said second ends of said hydraulic lines wherein said piston and said base-isolated support component are linked for a common inertial response to seismic activity.

19. The system of claim 18 wherein said master and servo cylinders are mounted horizontally in the same axis.

20. The system of claim 18 wherein said master and servo cylinders are mounted vertically.